

Fence

Electric Fence

Virginia Conservation Practice Job Sheet

Code 382(c)



Definition

A constructed barrier to animals or people.

Purpose

This job sheet is provided as a component of a resource conservation plan. This practice facilitates the accomplishment of conservation objectives by providing a means to control movement of animals and people, including vehicles.

Conditions Where Practice Applies

This practice may be applied on any area where management of animal or human movement is needed. Conservation plan maps showing the approximate fence location, complementary conservation practices, other relevant information, and additional specifications may be included.

General Criteria and Specifications

Fencing materials, type and design of fence installed shall be of a high quality and durability. The type and design of fence installed will meet the management objectives and site challenges. Based on need, fences may be permanent, portable, or temporary.

Position fences to facilitate management requirements. Plan ingress/egress features such as gates and cattle guards.

Plan and install fence to provide the desired control, life expectancy, and management of animals and people of concern by using the appropriate fence height, size, wire spacing and type of materials.

Use the VA Materials and Construction Specifications and this Job Sheet to plan, design and construct the appropriate type of fence to meet project needs.

Design and install fences to meet the life expectancy of the practice and to comply with all federal, state and local laws and regulations.

Landscape timbers shall not be used for any part of a fence system.

Fence Type

High tensile smooth wire fence is commonly used as a multi-strand permanent fence for both perimeter and subdivision purposes. It can be used to control almost all animals when properly spaced. High tensile smooth electric wire may be steel, aluminum or vinyl coated.

Electric fences may be permanent or temporary. The electrical power source can be from 110 or 220 electrical current or battery. Batteries may be re-charged by solar or electrical power. Fences may be of smooth steel, aluminum, braided steel wire, or metal woven with polyethylene or polypropylene fiber. Livestock must be trained to respect electric fence.

It is recommended that all wires on electrical fence have positive electrical charge

In VA climatic and soil environments, it is recommended that all wires on electrical fences should be electrified to provide the

maximum electrical conductivity and animal behavior modification. If heavy vegetation grows over the bottom wire, it should be fitted to allow it to be switched to a ground wire during that season.

Underground cable (insulated wire) is often used where wires are buried under gates and as leads from the energizer to the fence. Underground cable should be 12-1/2 gauge galvanized or soft steel wire with bonded, high-density, ultra-violet stabilized polyethylene or polypropylene insulation. Where underground insulated wire is buried under gates or roads, it is recommended to run the wire through a non-metal conduit (with water tight connections) to decrease the incidence of short circuiting over time

Specific information regarding allowable materials and construction for line posts, brace posts, brace assemblies, brace rails, fence wire, staples, fasteners, splicing, gates and other considerations are explained in detail in the text and Tables 1-9 of the Fence Materials and Construction Specifications.

Specifications are prepared in accordance with the NRCS Field Office Technical Guide. See Conservation Practice Standard Fence (382) and the Fence Materials and Construction Specification. Additional provisions are entered on the job sketch sheet.

Client/Operating Unit:	Farm #:
Field(s):	Tract #:
Planned By:	Location:
Date:	Length of Fence:
Landowner Objectives:	

Purpose (check all that apply)	
<input type="checkbox"/> Control the movement of animals	<input type="checkbox"/> Control the movement of humans
<input type="checkbox"/> Control the movement of equipment or vehicles	<input type="checkbox"/> Other (specify)
List type(s) of animals controlled:	

Electric High Tensile Fence - Type				
Use	# of Strands	Strand Spacing	Fence Height	Tension Recommended
Perimeter				
Travel Lane				
Interior Subdivision				
Surface Water Exclusion				

Permanent Electric Fence (Check all that apply)	
Wire Type	Coating/Composition
<input type="checkbox"/> High Tensile (HT), galvanized steel, smooth wire <input type="checkbox"/> Aluminum <input type="checkbox"/> Other _____	Size (gauge) _____ Coating/ Composition _____ Wire Strength (lbf or psi) _____

Line Posts	
Material Type _____	Diameter (in.)/weight _____
Shape _____ Length _____	Coating (if applicable) _____
Max post and/or stay spacing _____	Depth in ground _____
Other notes:	

Brace Posts	Brace (Guy) Wire
<ul style="list-style-type: none"> • Material _____ • Size/diameter and length _____ (Corner, ends, pull, and gate posts) • Size/diameter and length _____ (all other brace posts) • Depth _____ 	<input type="checkbox"/> 12.5 ga., galvanized steel, HT double wrapped <input type="checkbox"/> 9 ga., galvanized steel, soft wire single wrap <input type="checkbox"/> A single 3/16" galvanized cable with cable lock

Horizontal Brace Rail	Diagonal Brace Rail
<ul style="list-style-type: none"> • Material _____ • Size (diameter and length) _____ • Height from ground _____ 	<ul style="list-style-type: none"> • Material _____ • Size (diameter and length) _____ • Height of anchor post above ground _____

Temporary Electric Fence (Check all that apply)

Wire Type _____ Wire Size or Composition _____

Number of Strands _____ Fence Height _____

Wire Spacing above ground _____ Post type _____

Operation and Maintenance

Inspections and maintenance are required to achieve the intended function, benefits, and life of the practice. The landowner/operator is responsible to establish and implement an inspection and maintenance program. Regular inspection of fences should be part of an ongoing maintenance program. Items to inspect and maintain during the 20-year design life of the practice include, but are not limited to, the following:

1. Inspect fences after storm events to ensure the continued proper function of the fence. Promptly repair or replace damaged or broken fencing.
2. Retain and properly discard all broken fencing material and hardware to prevent ingestion by animals or injury to equipment, people, or animals.
3. Remove debris collected in the fencing.
4. Clear brush and vegetation from fence lines.
5. Remove fallen limbs from fence wires. Overhanging trees and limbs should be trimmed or removed as needed.
6. Maintain proper tension on the fence wires.
7. All necessary precautions should be taken to ensure the safety of construction and maintenance crews.

Other:

Planner Certification

The Fence practice planned in this job sheet fulfils minimum requirements of VA NRCS Practice 382(c).

Signature Title Date

Certificate of Practice Completion

The Fence practice planned in this job sheet has been completed according to NRCS specifications (indicate in Practice Specifications any changes to planned activities).

Signature Title Date

If needed, an aerial view or a side view of the practice can be shown below. Other relevant information, complementary practices and measures, and additional specifications may be included.

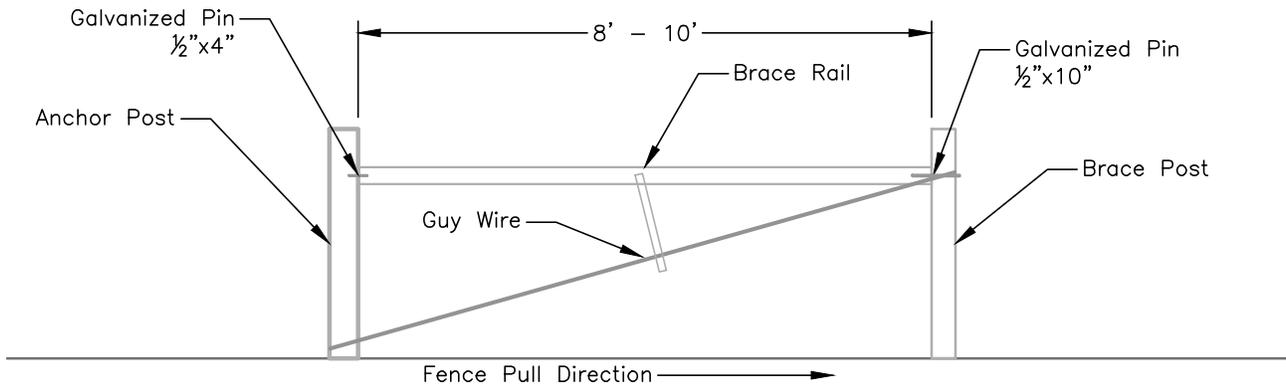
Scale 1"= _____ ft. (NA indicates sketch not to scale: grid size=1/2" by 1/2")



Additional Specifications and Notes:

“The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication program information (Braille, large print, audiotape, etc.) should contact the USDA Office of Communications (202) 720-2791. To file a complaint of discrimination write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.”

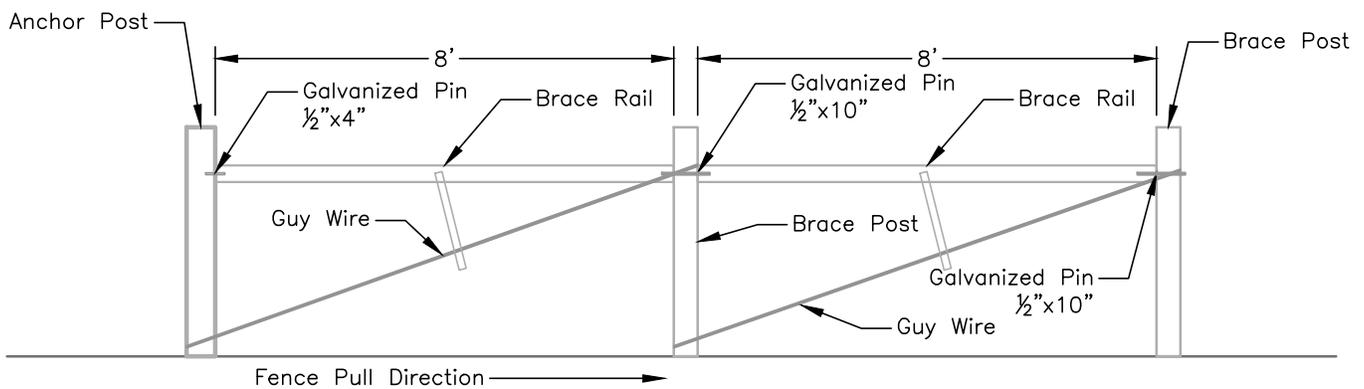
High Tensile Smooth Wire Electric Fence Construction and Installation Drawings



H Brace Assembly

Construction Notes

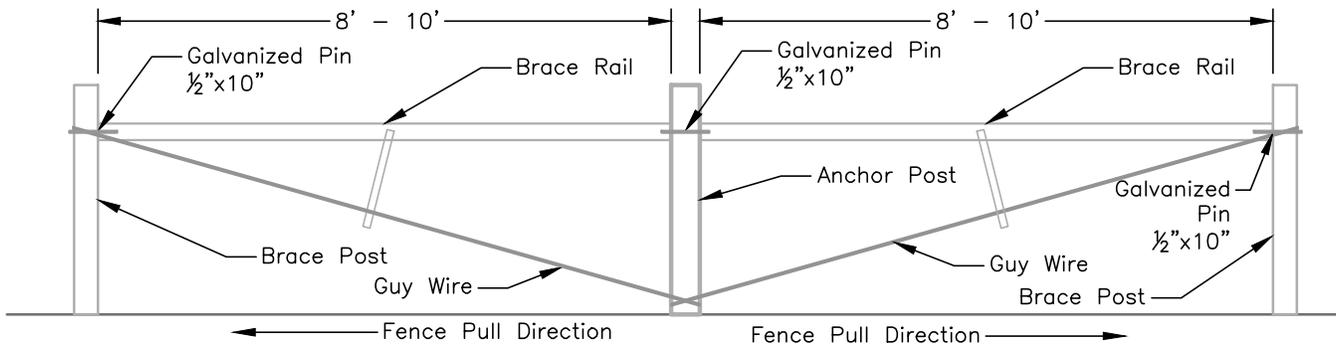
1. Brace width will be a minimum of 2 times the height of the top fence wire above the ground. (2½ times is preferred)
2. See Table 5 for corner, gate, and end post size and depth requirements.
3. Tension guy wires with a fence wire tightener or a treated twist stick approximately in the middle of the guy wire.
4. For guy wires, use 2 complete loops of 12½ ga. HT wire or a single strand of 9 ga. soft wire.
5. Brace rail should be between the top two fence wires, approximately 4" from the top of the post.



Double H Brace Assembly

Construction Notes

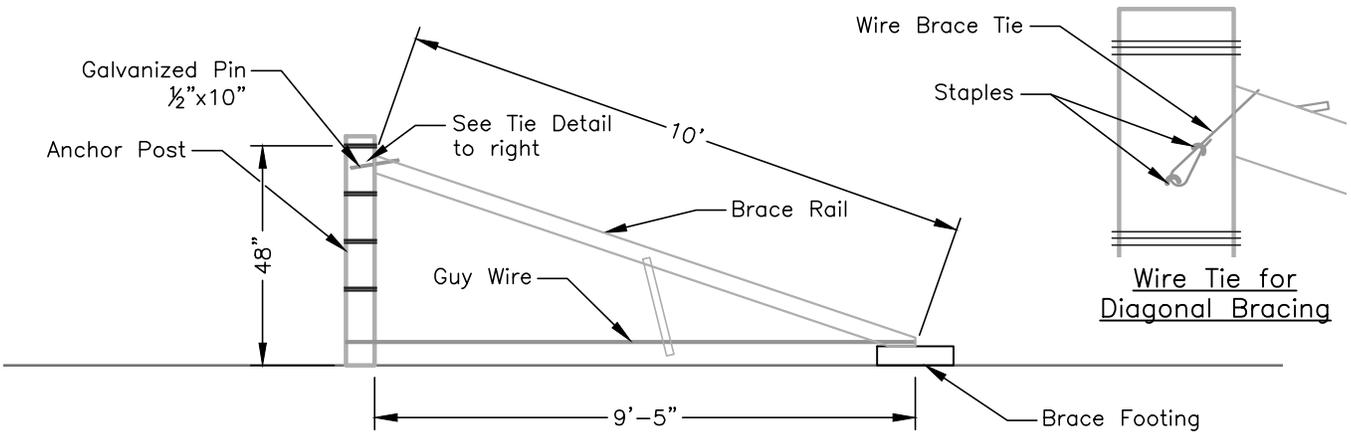
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In-Line Pull Post Assembly

Construction Notes

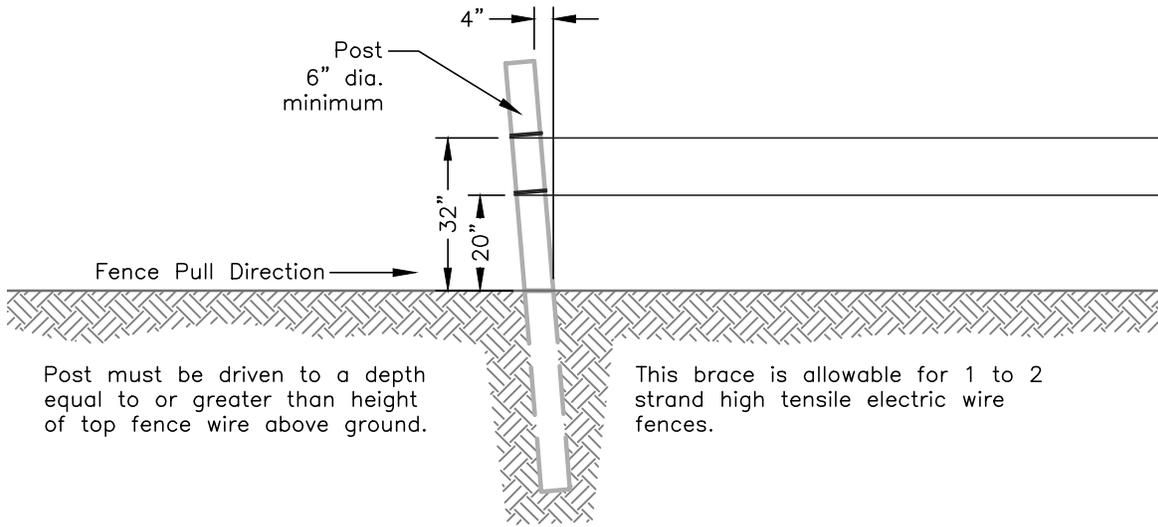
1. Brace width will be $2\frac{1}{2}$ times the height of the top fence wire above the ground.
2. See Table 5 for corner, gate, and end post size and depth requirements.
3. Tension guy wires with a fence wire tightener or a treated twist stick approximately in the middle of the guy wire.
4. For guy wires, use 2 complete loops of $12\frac{1}{2}$ ga. HT wire or a single strand of 9 ga. soft wire.
5. The fence wire shall be cut and tied off at the anchor post and start a new fence wire for the next fence section.
6. Brace rail should be between the top two fence wires, approximately 4" from the top of the post.



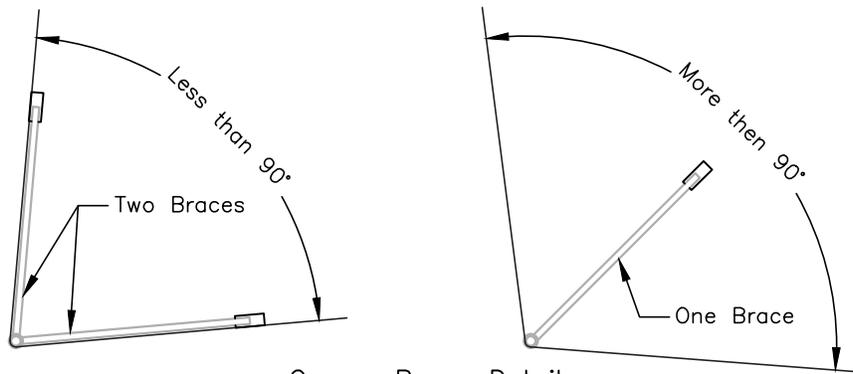
Typical Diagonal Floating Brace Assembly

Construction Notes

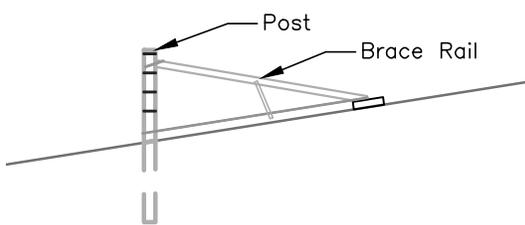
1. Diagonal brace member length will be $2\frac{1}{2}$ times the height of the top fence wire above the ground.
2. See Table 5 for corner, gate, and end post size and depth requirements.
3. Tension guy wires with a fence wire tightener or a treated twist stick approximately in the middle of the guy wire.
4. For guy wires, use 2 complete loops of $12\frac{1}{2}$ ga. HT wire or a single strand of 9 ga. soft wire.
5. The brace footing shall have 100 square inches of ground contact, at a minimum.
6. The footing shall be 2" to 4" thick and can be concrete block, paving stone or a flat rock.
7. A diagonal floating brace can be substituted at corner, gate, end post H brace assemblies and in-line pull assemblies.



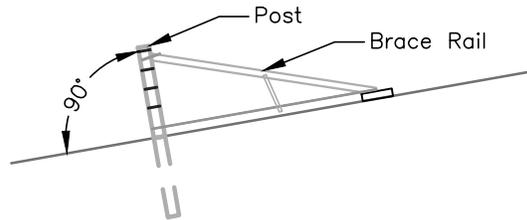
Single Post Brace Construction Detail



Corner Brace Detail Options

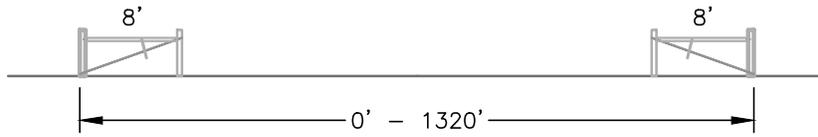


Posts on Slopes Up to 21% Slope

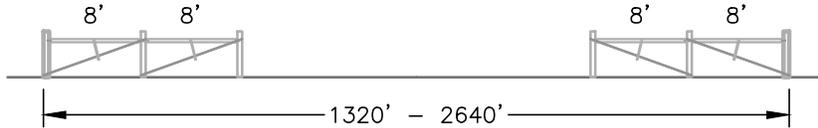


Posts on Slopes More Than 21% Slope

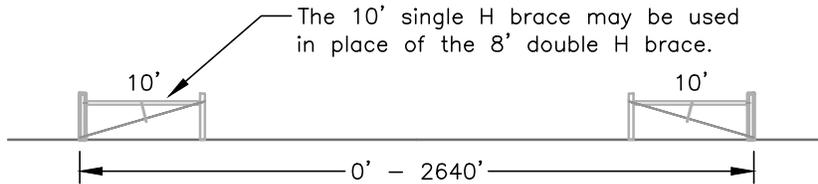
Single and Double H Brace Assembly Position and Construction
for High Tensile Smooth Wire Electric Fence



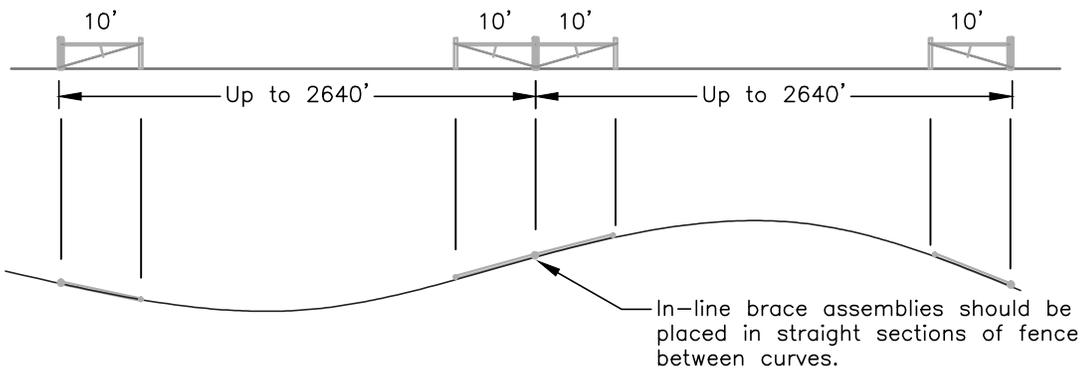
Single H Brace Assembly



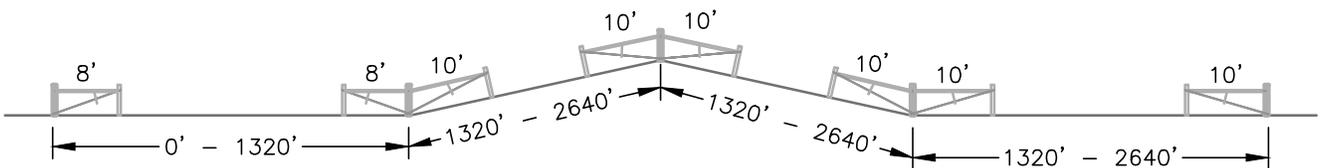
Double H Brace Assembly



Single H Brace Assembly

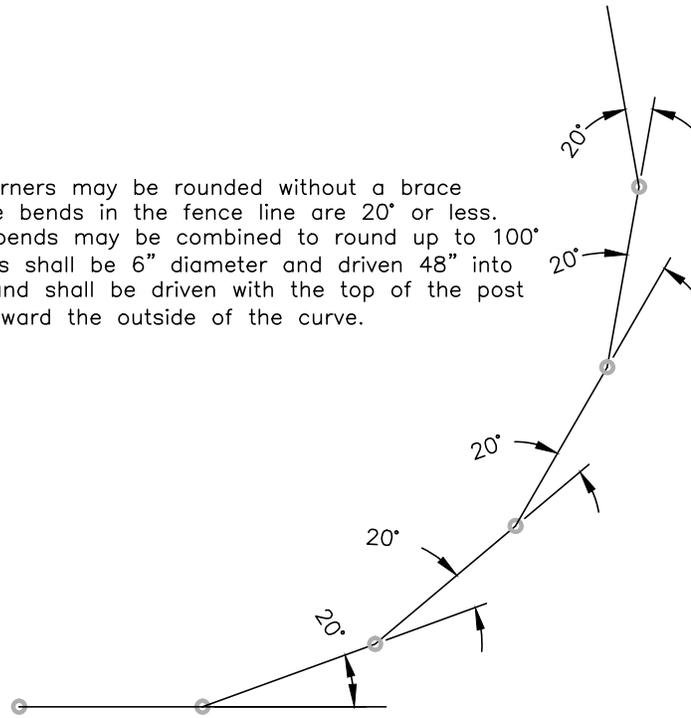


Curved Fence on Flat Land

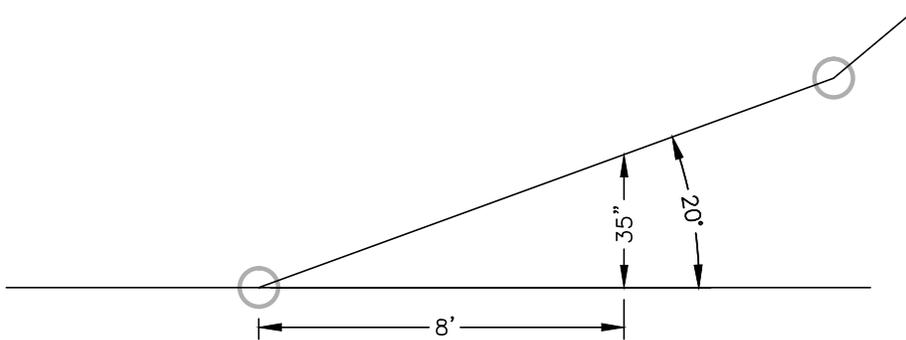


Straight Fence on Rolling Land

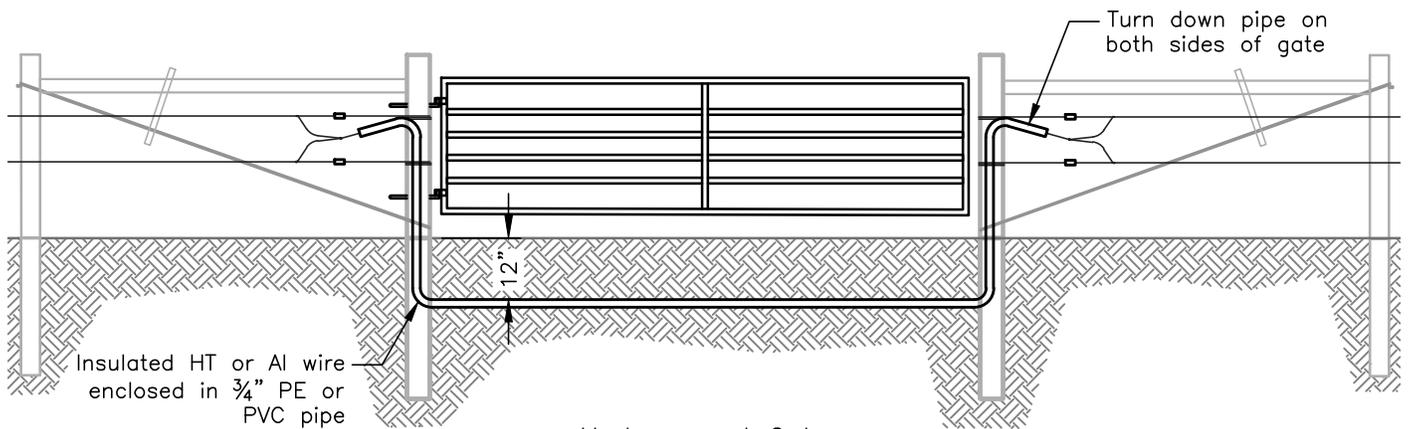
Curves or corners may be rounded without a brace system if the bends in the fence line are 20° or less. Multiple 20° bends may be combined to round up to 100° bends. Posts shall be 6" diameter and driven 48" into the ground and shall be driven with the top of the post leaning 4" toward the outside of the curve.



Rounding Sharp Corners or Curves



Determining Angle of Direction Change

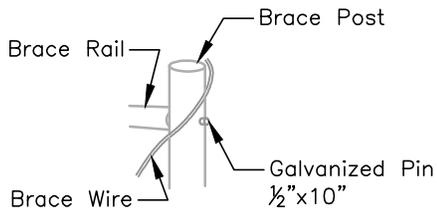


Insulated HT or Al wire enclosed in 3/4" PE or PVC pipe

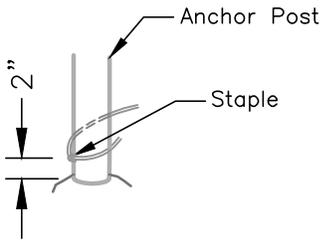
Turn down pipe on both sides of gate

Underground Gate

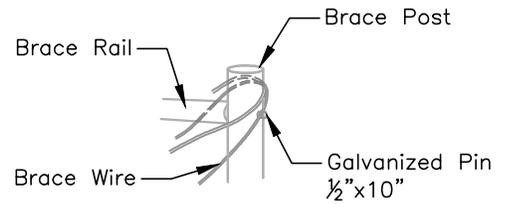
Brace Assembly Construction Detail



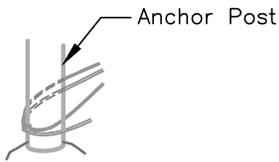
Wrap brace wire around brace post above protruding galvanized pin on opposite side from brace.



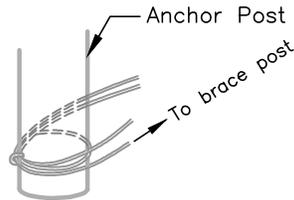
Drive a staple to half its length into anchor post about 2" from ground line opposite side of brace.



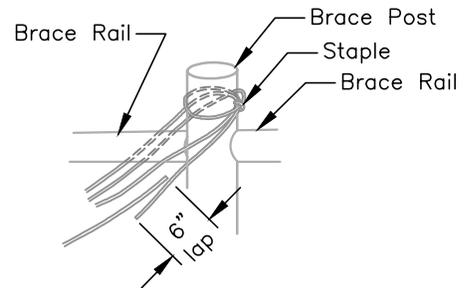
Unroll enough brace wire for two complete loops around anchor and brace post.



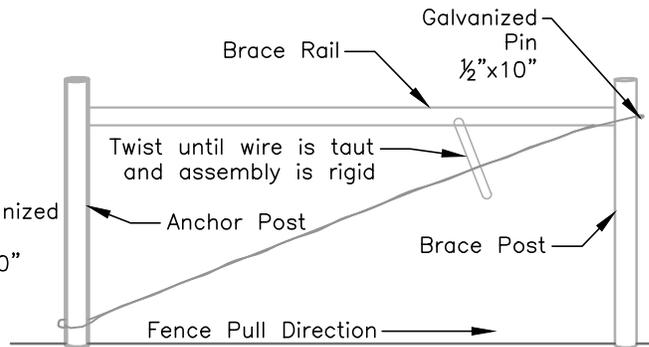
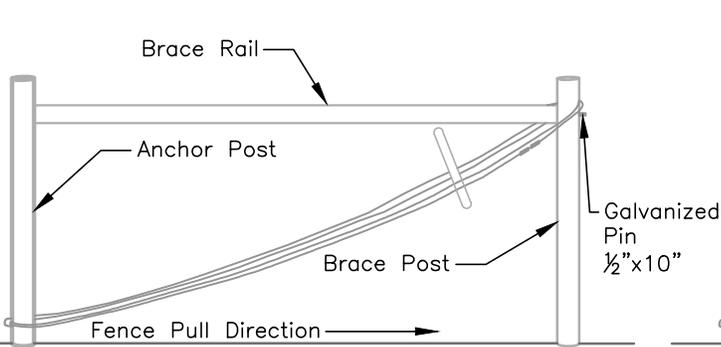
Thread end of brace wire through one staple and then through the other. Repeat to from three wire strands.



Wrap wire around anchor post and return toward brace post.



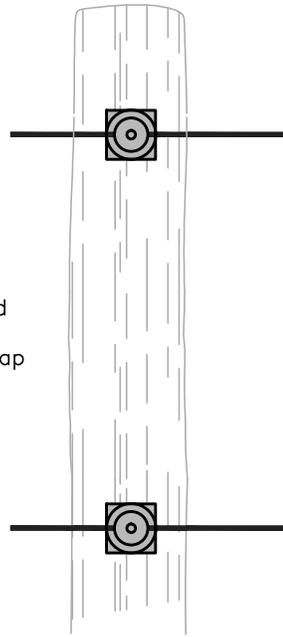
Cut brace wire from roll allowing enough wire to wrap around brace post and extend 6" to 12" past other wire end. Make splice.



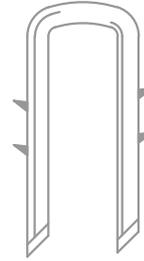
Wire Attachment Details

Note:

Many different styles of insulators are available for use on electric fencing. Insulators should be of high quality glazed porcelain or UV resistant HDPE or HDPP plastic. Tubular plastic insulators that wrap around end posts must have a reinforced plastic strip to prevent damage.

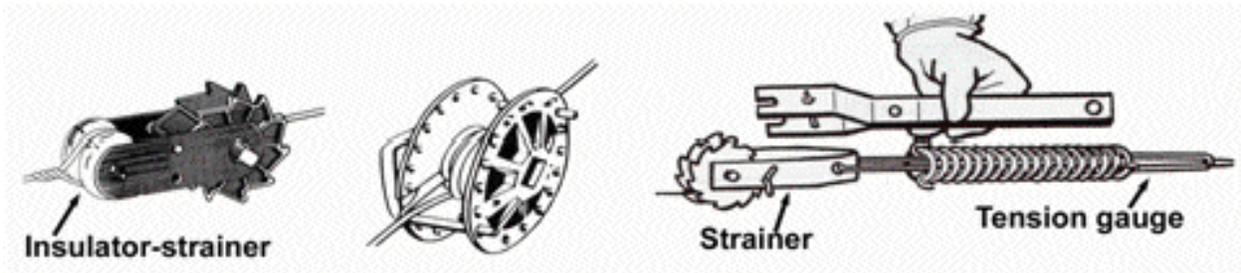


Wire and Insulator Attachment Details

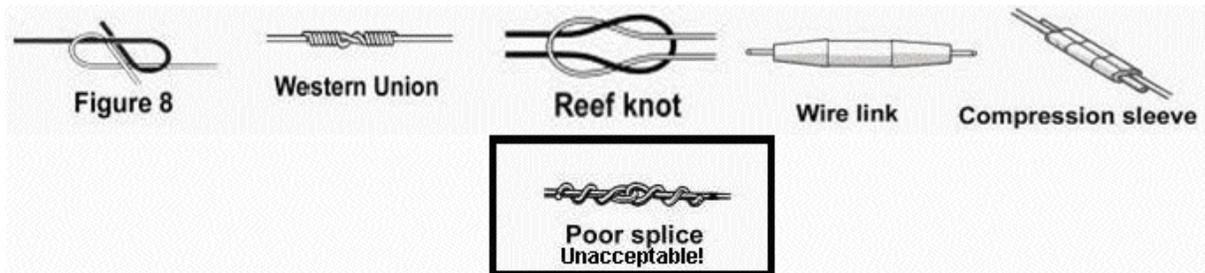


No. 9 gauge, Class 3 galvanized staple, 1½" minimum, barbed is strongly recommended.

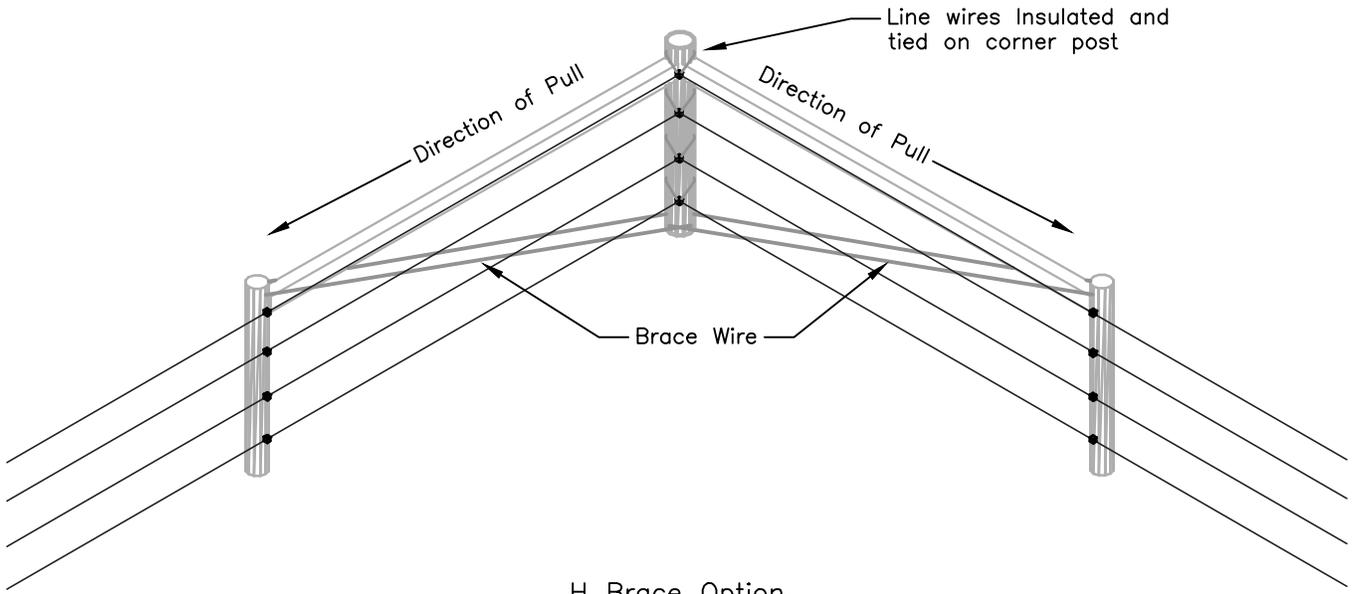
Staple Detail



Wire Strainer and Tension Components

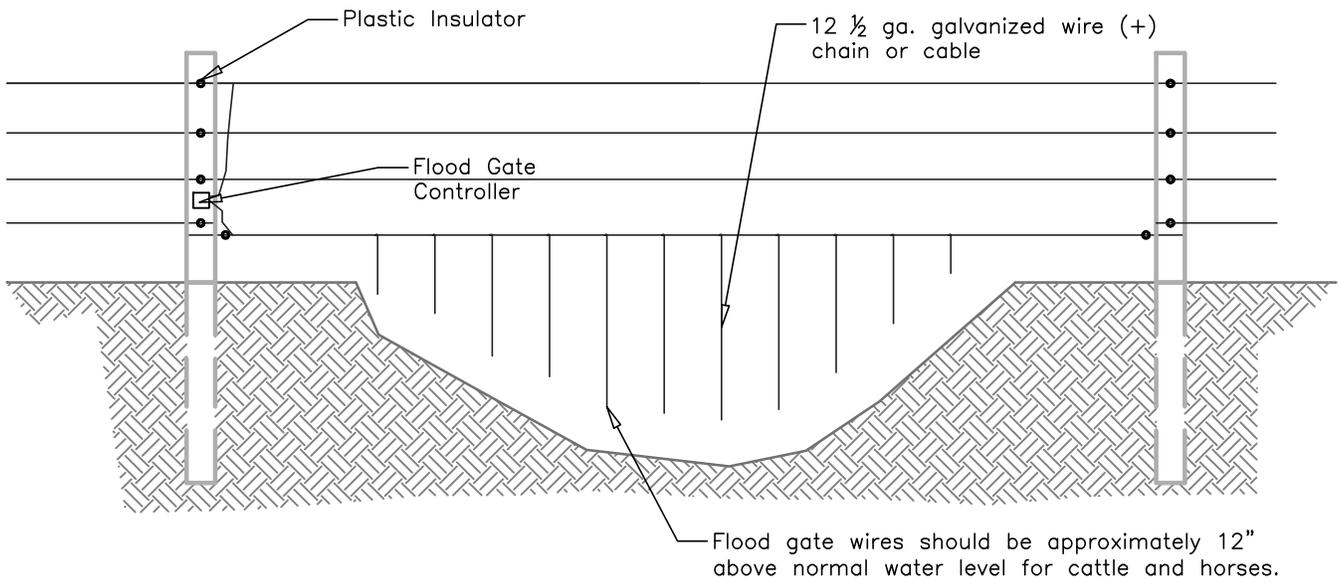


Wire Splice Options Details



H Brace Option

Typical Corner Brace Assembly



Electric Flood Gate